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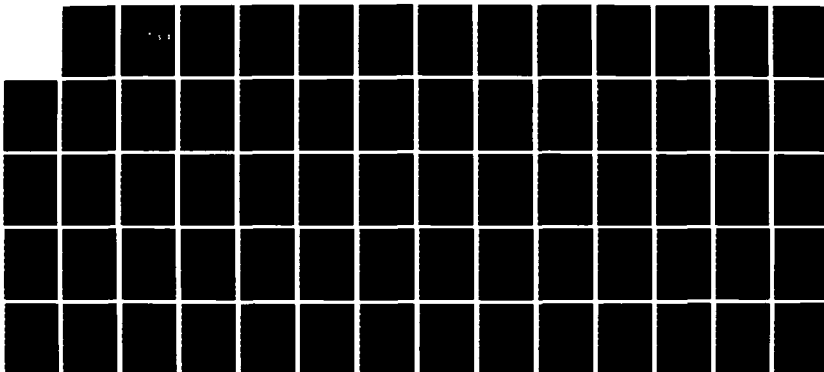
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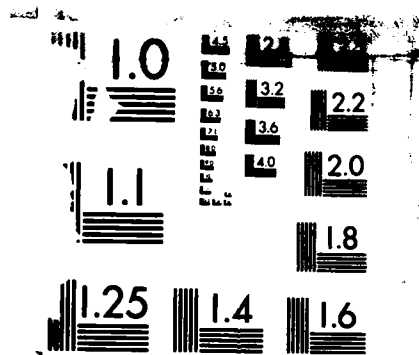
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## THESIS

A STUDY OF STRATEGIC PLANNING IN THE  
DEFENSE-ELECTRONICS INDUSTRY

Stephen R. Von Hitritz

June 1986

Thesis Advisor:

Fenn C. Horton

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# REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION <b>UNCLASSIFIED</b>			1b. RESTRICTIVE MARKINGS <b>A174 656</b>		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; Distribution is unlimited		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION Naval Postgraduate School		6b. OFFICE SYMBOL (If applicable) 54	7a. NAME OF MONITORING ORGANIZATION Naval Postgraduate School		
6c. ADDRESS (City, State, and ZIP Code) Monterey, CA 93943-5000			7b. ADDRESS (City, State, and ZIP Code) Monterey, CA 93943-5000		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) A STUDY OF STRATEGIC PLANNING IN THE DEFENSE-ELECTRONICS INDUSTRY					
12. PERSONAL AUTHOR(S) VON HITRITZ, Stephen R.					
13a. TYPE OF REPORT Masters Thesis		13b. TIME COVERED FROM TO	14. DATE OF REPORT (Year, Month, Day) June 1986		15. PAGE COUNT 68
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Strategic Planning, Planning Models, Business Objectives Determination		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
<p>In this study, the researcher examines long-range planning as practiced by certain companies in the defense-electronics industry.</p> <p>The approach is to: determine an acceptable planning model to be used as a reference; design a questionnaire from this reference model; and visit selected companies with the questionnaire to obtain data. From an analysis of the data, a judgment is made concerning how long-range planning is practiced by the companies visited.</p> <p>It was found that formal long-range planning is not as well established as one might conclude from the literature. Only two companies of the seven visited have employed long-range planning for longer than fifteen years. The planning of most of the companies fits the reference model; one major corporation's formal long-range plan does not. The difference is significant and is due to top management's concepts on formal planning.</p>					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL FENN C. HORTON			22b. TELEPHONE (Include Area Code) 408-646-2043		22c. OFFICE SYMBOL 54Hn



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A Study of  
Strategic Planning in the Defense-Electronics Industry

by

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Submitted in partial fulfillment of the  
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT


from the

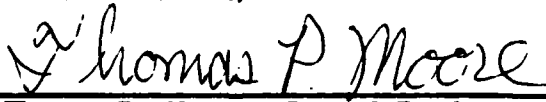
NAVAL POSTGRADUATE SCHOOL  
June 1986

Author:

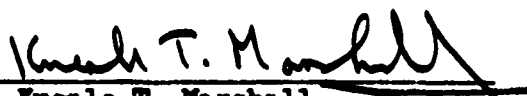
  
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## ABSTRACT

In this study, the researcher examines long-range planning as practiced by certain companies in the defense-electronics industry.

The approach is to: determine an acceptable planning model to be used as a reference; design a questionnaire from this reference model; and visit selected companies with the questionnaire to obtain data. From an analysis of the data, a judgment is made concerning how long-range planning is practiced by the companies visited.

It was found that formal long-range planning is not as well established as one might conclude from the literature. Only two companies of the seven visited have employed long-range planning for longer than fifteen years. The planning of most of the companies fits the reference model; one major corporation's formal long-range plan does not. The difference is significant and is due to top management's concepts on formal planning. It is concluded that many companies are still attempting to determine how to best apply formal long-range planning.

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## I. INTRODUCTION

### A. BACKGROUND

Most people subscribe to the concept of planning. They recognize the logic of the orderly and methodical creation of a course of action before embarking upon it. Ronald Reagan's meteoric rise to the Presidency of the United States is a good example of the planning that made this possible. International Business Machines Corporation's development over the past fifty years has been the product of long-range planning. IBM recognized itself as being in the computer business and planned a systematic approach to its growth long before the widespread use of systems engineering. Planning, therefore, is almost a universally accepted concept. Good planning involves both what is to be accomplished and how best to accomplish it. Long-range planning (LRP) is the name given to such practice. The length of the period of time encompassed by a plan is known as the plan's time horizon.

The term of a plan interposes a time dimension. It has been said, "A plan is a trap laid to capture the future." The time horizon that serves to differentiate long-range planning from normal operational planning. As the time horizon of a plan is lengthened, the degree of uncertainty becomes greater. This in turn leads to a change in the planning process. In short-range planning, most of the external and internal environmental factors are reasonably well known. This type of planning is quite detailed, and the time

horizon seldom exceeds one year. Such a plan, in business, is often termed a yearly operational plan. [Ref. 1]

Strategic planning, on the other hand, is that concerned with the corporate mission and purpose. It is not so much concerned with the element of time, as it is with the identification of future opportunities and threats, and the development and use of the company's resources to take advantage of the opportunities and avoid the threats. In this respect, the terms "strategic planning" and "long-range planning" are synonymous.

Long-range planning is a widely accepted management concept. It is taught in most business schools under a variety of titles. Much literature has been published on the subject. It therefore appears logical to expect most companies to embrace the concept of long-range planning. It also follows that one might expect some similarity in the planning processes used by companies within a given industry.

## B. PURPOSE

The purposes of this study are:

1. To examine long-range planning as practiced by certain companies in the defense-electronics industry.
2. To determine any discernible patterns.
3. To determine differences, if such exist, and the reasons for these differences.

## II. PLANNING MODELS

Given the large volume of published literature on the subject of long-range planning, it appears logical to assume that at least a few planning models exist. These models would show the essential factors that should be covered in planning and the methods used to apply these factors. These models could then be used to develop a questionnaire which, in turn, would reflect how each company applied long-range planning to its operations; differences could then be noted.

### A. THEORETICAL MODELS

Steiner [Ref. 2] in focusing specifically on long-range planning, states there are five steps to be considered:

1. Planning to plan.
2. Specifying objectives.
3. Developing strategies.
4. Developing detailed plans in major functional areas to fit the strategies. Such functional areas are:
  - a. Research and development.
  - b. Marketing.
  - c. Production.
5. Integrating of long-range plans with short-range plans.

## **Strategic Planning**

Answers--Where should we be going?

Defines Company purposes served and its preference

Analyses environmental factors influencing company, constraints and opportunities

Determines real abilities of company, management, finance, sales, and production

Selects strategic objectives

Documents it

## **Tactical Planning**

Answers--How will we get there?

Determines tasks to be done

Establishes who is responsible for what

Allocates resources

## **Implementation**

Sets quantitative measurements

Figure 2.1

Conceptual Model for Long-Range Planning

The above could be considered a conceptual model, or a framework for developing a model.

Terry [Ref. 3] expands upon the above by combining what he terms "Tactical Planning" with "Strategic Planning." He points out that while strategic planning answers the question, "Where should we be going?", tactical planning answers the question, "How will we get there?" Terry's conceptual model is shown in Figure 2.1.

Writing at a later date, Steiner [Ref. 4] states the approach to long-range planning should be tailored to answering the following questions:

- What business am I in?
- What is my place in the industry?
- What customers am I serving? Where is my market?
- What is my company image to my major customers?
- What business do I want to be in five years from now?
- What are my specific goals for profit improvement?
- Do I need to have plans for product improvement? If so, what?
- What is my greatest strength? Am I using it well?
- What is my greatest problem? How am I to solve it?
- What share of the market do I want? Next month? Next year?
- Are my personnel policies acceptable to employees?
- How can I finance growth?

Although the above is stated in topical form, it appears to conform to the model shown by Terry. Steiner asks these questions, not to



establish a sequential strategy planning process which he has already done, but to indicate the types of questions a model should answer.

Bruce Payne [Ref. 5] has also enumerated the steps to be followed in constructing a long-range plan. He does not spell out in detail how the plan should be modeled, but rather suggests what top management should seek in plan content. Like Steiner, Payne presents his steps in question form:

- Has the planning team determined the key influences in the growth of the industry and evaluated the influence of each?
- Have the strengths and weaknesses of the company been accurately evaluated? (including strengths and weaknesses of competitors?)
- Have the capacities of different company functions to support the plan been projected far enough ahead?
- Is there a practical timetable?
- Have alternatives been considered?
- What provisions have been made for future reverses?

Payne raises questions about the consideration of alternatives, and whether provision has been made for future reverses. These questions do not appear in the other models. This points up the problem of how much detail should go into the model and whether it is detail or general. This is discussed later.

A review of the above four outlines or models reveals a commonality that will serve as a model for long-range planning in this thesis. As a minimum, it appears that a planning model should encompass the following areas:

1. Purpose of the organization.
2. Information on the external environment.
3. Information on the company's strengths and weaknesses.
4. Identification and analysis of factors limiting the firm's opportunities.
5. Establishing objectives and goals based on the above.
6. Development of strategies.
7. Determining a plan of action to achieve the objectives in a given time frame.

The above is used as a reference point for analysis of the long-range planning which is used in the companies visited.

It is appropriate at this time to consider the detail that should go into a model to be used to compare each company's long-range plan. Payne mentioned topics such as alternative plans and contingency planning. Steiner asks, "Are my personnel policies acceptable to employees?" and "How can I finance growth?" Aside from the content of the plan, questions about process arise. For example, are the problems facing the firm sufficiently defined? Have all the alternatives been examined? How is feedback obtained? How is the plan updated or modified by newer information?

To answer these questions, it is necessary to define what a company's long-range plan is intended to accomplish. The plan is the path that the company selects to take it to where it wants to be. This involves much planning by many people at various levels in an organization, and over a period of many months. The detail that is gathered is a function of both time and the size of the company.

For example, in a five-year plan, the detail in the first year may be considerable, becoming smaller in the later years, as the outlook is less certain, and the cost of estimating such detail is not justified.

If a company or division has many products, or product lines, plans must be developed for each. These plans must be detailed because they must consider choices such as make or buy, lease or purchase, invest or not in engineering development, or increase or decrease commodity promotion. These considerations are part of the planning process. The essence of all these smaller and detailed plans is then distilled into the company long-range plan.

The basic approach to planning, the setting of a target, the definition of the problem, the development of alternatives, the consideration of the risks and rewards, the selection of the best alternative, and the development of plans for its implementation are all necessary ingredients in arriving at a decision process. These decisions find their way into the supporting plans, but only the major decisions and major strategies which result from this process constitute the general steps in the long-range planning model. The model must ensure that consideration is given to the essential factors and that action plans exist to carry out the decisions and strategies.

The model cited above provides a basic outline so that a comparison may be made with the long-range plans of the companies visited.

## B. EMPIRICAL MODELS

A review of the literature was also made to gain insight on how companies are reported to be doing their long-range planning. The following three cases illustrate how this planning is practiced. At first glance, one might think each firm viewed planning differently. Closer scrutiny, however, will show a marked similarity to the major factors enumerated in our model, and this despite the fact that the companies are in different industries: food; machinery; and chemicals.

Danielson [Ref. 6], in his work of developing long-range planning at Archer-Daniels-Midland Company, reported on the model used in that company. First, the economic influences on the business were evaluated. At this point, sales projections were made with proposed marketing programs to substantiate the projections. Five-year goals were then developed with the first year described in detail and becoming the budget. After agreement was reached on all factors, the plan was reduced to writing and became the five-year plan in the following format:

### Introduction

Firm's present position in industry

Objectives of company and the ultimate goals to be achieved

Review of marketing position, production facilities,  
research capabilities and management skills

Major changes contemplated

Capital requirements

Financial results

## **Detailed Reports**

**Marketing**

**Manufacturing**

**Research and Development**

**Management**

**Financial analysis**

The above description of the decisions made during meetings conducted prior to recording the plan is probably typical of what takes place in most companies. Much information is gathered, screened, and analyzed in arriving at agreements.

Long-range planning at American Machine and Foundry Company revealed a much more comprehensive model [Ref. 7]. Each operating division, using a series of planning forms, develops a five-year plan based on the following seven categories:

### **1. Market**

- a. Present major product lines and projected new major product lines
- b. Total industry volume and unit sales volume in each product line

### **2. Competition**

- a. Present major product lines and projected new major product lines
- b. Total industry volume and unit sales volume in each product line

### **3. Factors affecting unit performance**

- a. Future price structure
- b. Direct labor and indirect labor costs

- c. Marketing strategy
- d. Trends within industry
- e. Technological changes affecting product cost and usage
- f. Market penetration (percent and dollar volume)
- 4. Unit requirements
  - a. Spending for research and development
  - b. Spending for machinery and equipment
  - c. Spending for buildings
  - d. Market research program
  - e. Advertising program
  - f. Personnel and training
- 5. Operations summary
  - a. Net revenues
  - b. Pre-tax profits
  - c. Assets employed
  - d. Profit margins
  - e. Asset turnover rates
  - f. Return on Assets employed
- 6. Cash flow
- 7. Acquisition opportunities

Ewing [Ref. 8] points out that some of the topics to be considered in the formation of a long-range plan are well set forth by Donald J. Smalter of International Minerals and Chemicals:

- 1. Charter
  - Scope, purpose, objectives
- 2. Position

- Industry, structure and character
- Profit sources
- Life-cycle stages of products
- Market share and area
- Utilization of capacity
- 3. Attributes or Capabilities
  - Strengths
  - Weaknesses
- 4. Environment
  - Outlook for market demand
  - Competition for price
  - Distribution channels
  - Changing technology
  - Trends in the economy
  - Regulatory constraints
  - Community constraints
- 5. Impact of trends and conditions on the company
  - Problems and needs
  - Threats
  - Opportunities
- 6. Momentum of present operations
  - Prospects and goals
  - Premises
  - Profit and loss summary
- 7. Programs of action

Response to environmental challenges

Response to present strengths and weaknesses

8. Technical

9. Organization

10. Goals

These three empirical models appear to be quite different. A little analysis, however, reveals they have much in common, both with each other and with the generic planning model defined previously. Table I shows a comparison, using the essential steps of the planning model, as a reference.

Without planning instructions to define the content of each section, the analysis of the empirical models must be based on the outline with a judgment made on the content of each item. For example, it might easily be concluded from the outline that Model 1 did not consider the external environment. However, Danielson pointed out in his discussion of the plan that both competition and the economic influence on the business were evaluated as part of the plan. This is not readily apparent from the outline by itself



Table I  
Comparison of Empirical Models' Contents

Planning Model	Model 1*	Model 2**	Model 3***
Purpose		x	
External Environment	x	x	x
Internal Environment	x	x	x
Problem Areas		x	x
Objectives and Goals	x		x
Action Plans	x	x	x

\*Archer-Daniels-Midland Company.

\*\*American Machine and Foundry Company.

\*\*\*International Minerals and Chemicals Company.

Comments on each model, in a comparison with the planning model, are given below:

Archer-Daniels-Midland Company. The mission or purpose of the organization appears to be missing, as does discussion of problem areas. The latter may not be explicitly mentioned in the plan outline, but one may infer that the review of the marketing position, production facilities, research capabilities, and management skills was for the purpose of uncovering or addressing problem areas. This points up the difficulty of attempting to be precise in evaluating a model from its outline only.

American Machine and Foundry Company. Despite the more comprehensive outline, objectives and goals appear to be missing. It may be inferred that they are included under "Operations Summary," although the outline is not specific. Again, the mission of the company is omitted.

International Minerals and Chemicals Company. This model appears to match the planning model.

There are many similarities among the three companies' plans. The differences which appear seem to be due to the company's desire to emphasize certain factors, or to incorporate more budget information. For example, one firm may wish to have the price structure of its product line given special emphasis; another firm may treat this aspect under market conditions. The important point is that the basic planning factors are recognized and given treatment.

### III. METHODOLOGY

#### A. APPROACH

Seven local electronic companies were visited to discuss the manner in which they did long-range planning.

##### 1. Questionnaire

Using the planning model as a guide, and with the help of selected readings (Appendix B), a questionnaire was developed. The model identifies five distinct steps:

1. Purpose or mission of firm.
2. Examination of external and internal environment.
3. Identification and analysis of problem areas and establishing a strategy for each.
4. Establishing objectives and goals.
5. Determining action plans.

The questionnaire attempted to obtain a description of how companies performed these five steps. It was believed if the company were asked if it observed these five steps, an affirmative answer would most likely be received. Therefore, the questionnaire was designed to probe in depth. For example, rather than ask if the planning examined the external environment, the questionnaire asked, "Does the economic forecast correspond to the time frame of the Plan?" and "Does the Plan specifically indicate market share of the company's competitors?" In this manner, answers were obtained on specific subjects which allowed judgments to be made on the extent that external factors were considered.

It also should be noted that the questionnaire most frequently refers to the formal plan, a document, and not to the planning process. Many ideas and thoughts enter into the planning process; attempting to identify and evaluate them would be both difficult and nebulous. However, if a subject appears in the Plan, one may assume some consideration is given to it.

The questionnaire also contained questions which would provide some background on the development of the Plan and its use. These were questions of a general nature. For example, the answer to the question, "How long has formal planning been carried on?" may be an indication of the sophistication of the formal planning process. Another question, "To what level of management is distribution of the Plan made?" may be an indication of who is involved in the development and use of the plan.

In summary, the questionnaire was designed to identify the five distinct steps of the planning model, to provide broad information on the development and use of the plan, and to stimulate discussion. All of the questions in the questionnaire were asked of each firm except one. This company that had no formal plan documentation. In this organization some of the questions were asked in order to explore the depth of the informal planning process there. A copy of the questionnaire is shown in Appendix A.

## 2. Subjects

The companies visited were local to the San Francisco Bay Area, and were in the electronics industry. All had recently been awarded defense contracts or subcontracts. A description of the companies is to be found at the end of this chapter. Each firm has been given a code letter for easy reference to exhibits.

In all cases except Company D, the person interviewed was directly involved in the planning function for his company. The titles of the persons interviewed were the following:

- Company A - Manager, Corporate Planning and Economics;
- Company B - Vice President, Corporate Development;
- Company C - Manager of Planning;
- Company D - Director, Business Development Group;
- Company E - Manager, Planning and Market Research;
- Company F - Manager, Marketing Planning;
- Company G - Director, Corporate Planning and Research

Most information was obtained through personal interviews; occasionally some written documentation was given to the interviewer. There was reluctance to allow detailed inspection of the long-range plan, as the companies felt that the content of the plan was confidential. Discussion centered mostly on what was included in the written plan, and the factors ostensibly used to develop the strategy. No attempt was made to evaluate how well the factors were used.

## B. LIMITATIONS

The study is limited to seven companies. Five are multidivision firms, and two are small corporations (yearly revenues of \$500 million or less). In the case of multidivision companies, the study concerns only the division level, the revenue-producing unit, not planning done at higher structure levels such as at group or corporate level.

## C. COMPANY DESCRIPTIONS

### 1. Company A: Hewlett-Packard Company

This company is a major designer and manufacturer of precision electronic equipment for measurement, analysis, and computation. The company makes more than 4,000 products which are sold worldwide and have broad application in the fields of science, engineering, business, industry, medicine, and education.

Principal product categories include test and measurement instrumentation and solid-state components (42 percent of sales); computers and computer systems, electronic calculators, and computer/calculator peripheral products (42 percent of sales); medical electronic equipment (10 percent of sales); and instrumentation for chemical analysis (6 percent of sales).

Sales totaled \$6.51 billion in 1985.

2. Company B: Varian Associates, Inc.

This is a high technology company marketing products in the areas of communications, industrial equipment, medicine, scientific research, and defense. Its products include: leak detectors, vacuum systems, medical linear accelerators, diagnostic scanners, high intensity lamps, power circuitry transistors, mass spectrometers, and chromatographs.

Sales totaled \$973 million in 1985.

3. Company C: Dataproducts Corporation

This company designs, manufactures, and sells peripheral equipment for use in minicomputers, terminals, and other data processing systems. Products include line printers, matrix printers, core memories, and data communications equipment.

Sales totaled \$472 million in 1985.

4. Company D: California Microwave, Inc.

This company designs, manufactures, and sells capital equipment to the telecommunications and defense electronic markets. Products include signal sources, automatic test systems, frequency converters, and small capacity telecommunications earth stations.

Sales totaled \$105 million in 1985.

5. Company E: GTE Electronic Systems Group, Western Division

This organization is engaged in the design, manufacture, and

support of electronic systems, products, and services in the electronic defense and electro-optics areas. Commercial products include industrial lasers and security systems.

Sales totaled \$805 million in 1985.

6. Company F: Data General Corporation

This company is engaged in the design, manufacture and sale of general purpose computer systems, including peripheral equipment and software, and provides related products and services, including training and maintenance.

Sales totaled \$1.24 billion in 1985.

7. Company G: Control Data Corporation

This company designs, develops, manufactures and markets large-scale, general purpose, digital computer systems, and develops and supports related software and provides financial and insurance services.

Sales totaled \$3.68 billion in 1985.



#### IV. DISCUSSION

##### **A. FACTORS IN PLANNING**

The method of evaluation of each plan is to determine if it contains the essential elements of the planning model. This is accomplished by developing a matrix as shown in Table II. In this way, comparison among the plans also may be noted. The factors are obtained from the planning model. For example, the factors of purpose (mission), objectives, and goals are taken directly from the model. Other factors are obtained by considering those separate parts of the external environment acting on the firm's opportunities. Similarly, the internal factors having a bearing on the company's competence and limitations are listed separately. Each firm is rated on those factors specifically mentioned in the company's long-range plan, not on whether they are considered in the planning process. One factor, strategy, shown in the matrix needs further explanation. The definition of strategy has multi-dimensional aspects, according to the concept in which it is used. As used in the study, it means a pattern of objectives, consistent with the mission of the company, and written plans (within the content of the long-range plan) for achieving these objectives. As an example, one very successful firm has a long-range plan which omits mention of any written description to achieve its objectives. This company's long-range plan would not be considered to incorporate strategy.

A problem of semantics was encountered in discussing objectives and goals. For the purpose of this study, the definitions used are those set forth by Vancil and Lorange [Ref. 9]. Objectives are general statements describing the size, scope, and style of the enterprise in the long term. For example, an electronics firm's sales objective might be to rank first in sales of electronic countermeasures systems to the U.S. Navy. A financial objective might be to achieve a 20 percent return on investment after taxes. Goals are defined as specific statements of achievement, targeted for certain deadlines. For example, a goal may be to earn \$9 million profit, after taxes, for 1986.

Another factor in the planning model that may need explanation is mission, also known as purpose. All companies come into being to serve a specific purpose. It is essential for coordinated action at all levels of an enterprise that the purpose of the company be clearly and explicitly defined. Not to do so is to risk diffusion of the company's strength, since it is unlikely that a firm can be a leader in all markets. Generally, purpose is expressed in terms of markets served, and products or services offered. The planning model lists mission as its first factor.

The matrix shown in Table II was constructed from the data gathered by the questionnaire. It shows whether the company's formal plan considers those essential factors contained in the planning model. Other data, obtained from the questionnaire, is helpful in gaining a qualitative assessment of the firm's planning.

Table II  
Planning Factors Used in Long-Range Plan

Factors	Company						
	A	B	C	D	E	F	G
Mission			X	†	X	X	X
Objectives		X	X	†	X	X	X
Goals	X	X	X	†	X	X	X
<u>External Factors</u>							
Economy	*	*	X	†	X	X	X
Competition		X	X	†	X	X	X
Market		X	X	†	X	X	X
Government		X	X	†	X	X	
Society				†	X		
<u>Internal Factors</u>							
Finance	X	X	X	†	X	X	X
Technology		X		†	X	X	
Facilities	X		X	†	X		X
Manpower	X		X	†	X	X	X
Strategy		X	X	†	X	X	X

\*Published separately as part of Plan instructions.

†No formal planning document.

Certain selected items from the questionnaire are shown in Table III.

These factors, as shown in Table III, will be discussed, as appropriate, under each company's evaluation. One item, however, is of general interest: social planning. With the recent emphasis on social planning, or social accounting, the interviewer was curious to learn the extent to which it is considered in formal long-range planning. Only one company makes mention of it. Most respondents indicated that their company had other plans and policies which pertained to this subject. Yet the planning model can be construed to include this subject as a factor bearing on the external and internal environment of the firm. Apparently, the companies do not feel social planning is sufficiently important, or that its impact is enough, to consider it in formal long-range planning.

Table III  
Selected Items from Questionnaire

Selected Items	Company						
	A	B	C	D*	E	F	G
Time period of LRP (in years)	6	5	5		5	5	5
Time before Plan revision (years)	1	1	1		1	1	1
History of formal planning (years)	20	10	8		9	20	8
Is social planning mentioned?					x		
Does Corporate have planning position?	x	x	x		x	x	x
Does Division have a planning position?			x		x	**	x

\*No formal planning.

\*\*No divisional structure.

## B. COMPANY COMPARISONS

### 1. Company A: Hewlett-Packard Company

This company has grown from \$1.37 billion in sales in 1977 to \$6.51 billion in 1985. H-P continues to lead in the production of electronic measuring and scientific equipment.

This study revealed that H-P's approach to long-range planning is somewhat unique. In 1955, David Packard [Ref. 10], then president of Hewlett-Packard, said:

The keystone of our entire program at Hewlett-Packard can be summarized in the statement that we believe tomorrow's success is based on today's performance. In our opinion, this is so obvious a statement as hardly to require repetition, but we often see other firms which are so busy worrying about tomorrow that they never quite seem to do otherwise, and the first order of business is almost always to make sure that current operations are on a sound and profitable basis. It is true this approach is fairly conservative and that our rate of progress has been somewhat limited by our desire to avoid overcommitments to the future, but on the other hand, we find that when we have our current situation under firm control, all our key people seem to have a little more time to look constructively toward the future.

Corporate planning in Hewlett-Packard was introduced in 1965, when revenues were approximately \$200 million per year. Prior to that time Dave Packard and Bill Hewlett closely controlled the company's decision making processes and had not felt the need to formalize any planning. Commenting on the H-P style of planning, President John Young recently told a meeting of Canadian managers that planning alone is not what determines H-P's future. The most important factor in setting the future directions of the company, he noted [Ref. 11], is its current activity, especially that of developing and marketing proprietary new products. "That's where we put our money and that's where we look for growth." Young pointed out that H-P's continuing investment in proprietary product programs by the operating divisions provided strong assurance of steady growth; on the other hand, technological development out of the laboratories added new dimensions to the company. "But no one can plan that."

Hewlett-Packard's annual planning cycle begins each spring when a six-year planning outline is issued by corporate headquarters

to group managers. The outline includes the economic environment, instructions, planning formats, and calendar. About ten weeks later the plans are due back for consolidation and corporate review. The forecasted economic environment is international in scope (H-P operates worldwide; 46 percent of 1985 sales came from international customers) and does not attempt to relate specifically to any product line or product markets. Deducing such relationships is left up to the Group or Division Manager. The submitted plan consists of about two pages of data on items such as revenues, profits, return on investment, inventories, receivables, cash flow, pricing, and so on. Two or three pages of written commentary amplifying the data is also submitted. This forms the complete division plan which is consolidated with plans from other divisions to form the group and, subsequently, the corporate plan.

The corporate planning group (five people including a secretary) feel that the annual planning exercise provides a coherent point, a snapshot of where all the components of the organization intend to be during the next six years.

One might deduce from the above description that there appears to be an absence of strategic planning, considering the concentration on operational data. However, H-P is an eminently successful company, achieving a 400 percent growth in the last nine years. Furthermore, Hewlett-Packard has maintained unchallenged leadership in the electronic test and measurement industry. It is

difficult to concede that H-P accomplished this performance without some sort of strategic thinking shaping its growth.

The answer appears to be that H-P did engage in strategic planning. It was done by the two entrepreneurs who started the firm. Their objective was to develop sophisticated proprietary test and measurement equipment that was unequalled for quality and precision. The company had the technical excellence to do this. The rapid growth of the electronics industry created a demand for such equipment. Hewlett-Packard's strategy developed as it proceeded; at least there was no structured plan setting forth the strategy of the firm. H-P had an organization that allowed managers great freedom of action in attaining well-defined objectives. Profit was emphasized as a major objective, and adherence to budget was measured and rewarded. The company was structured by divisions and responsibility for performance was pushed down to the profit centers. Dave Packard's statement, quoted above and made more than thirty years ago, was, "The first order of business is . . . to make sure that current operations are . . . profitable." This researcher gained the impression that the unstructured type of formal planning is still desired. There is little doubt that strategic thinking is being carried on in the operating divisions; the present planning system does not call for it to be recorded.

It seems that long-range planning at H-P is more unstructured than might be found in a company practicing planning for twenty years. Data such as cash flow, profit, inventories, and return on



investment are specific items found in the plan. Consideration of factors like company strengths, the effects of government regulation, the market position of competitors, and action plans are not explicitly required to be shown in the formal plan. In summary, formal long-range planning at H-P does not appear to follow the structure of the planning model.

## 2. Company B: Varian Associates, Inc.

Formal long-range planning was introduced into this high technology company about ten years ago with the appointment of one of the company's senior executives to the position of Vice President of Corporate Development.

The company is structured into five operating groups, Electron Devices, Instruments, Industrial Equipment, Medical, and Information Systems. Within the groups are operating divisions which are profit centers. Each group has a five-year plan which is a consolidation of the operating division plans.

The corporate approach to developing the long-range plan is to send out instructions with a copy of the economic forecast for the five-year period. The forecast is prepared by corporate marketing. The operating groups and divisions use this forecast in developing their plans. The corporate instructions also specify a format to be followed, in addition to requiring specific quantitative data:

1. Summary
2. Environment

3. Capabilities
4. Business Strategy
5. Changes from Past Year
6. International
7. Contingencies and Alternatives

The company's somewhat brief history with long-range planning is causing it to modify parts of the planning process as the firm discovers problem areas. For example, the firm has not felt it necessary to specify the mission of the organization. However, discussion among the divisions on the types of work in which they should engage has led to a decision that the mission (charter) of each organization should be defined. Future plans will include this factor.

Another aspect of the evolving state of planning is the matter of resources. The long-range plans of the operating groups and divisions do not include manpower planning. Some of the divisions do not show plans for equipment facilities or engineering. This matter is now under discussion and it is expected that future planning instructions to the groups will request that resource plans be a part of the long-range plan. In the past, the corporate office prepared plans of the manpower required, the estimated facilities cost, and the cost of the corporate research and development effort.

In summary, the planning at Varian appears to be evolving. At present, some of the factors in the planning model are not contained

in the five-year plans. The intent seems to be that these factors will be a requirement in the next year's long-range plan.

3. Company C: Dataproducts Corporation

This is a young, fast growing company in the data processing field, with revenues climbing to \$472 million in 1985. Printers accounted to 75 percent of sales, core memories were 16 percent, and telecommunications constituted 9 percent.

In the past year, the corporation has established the position of Director of Financial and Operations Planning at division level. Each division has been submitting a condensed version of its plan to the corporate office. A combined plan is then issued. Starting next year, each division will issue its own plan, separately, allowing for greater coverage of detail.

The division plan appears to cover all aspects of the planning model except the technology plan. No reason was advanced for this. Planning is evolving in this company.

4. Company D: California Microwave, Inc.

It was found that this company was considering long-range planning, had developed strategies to follow in the pursuit of business, but had not reduced their plans to any formal document. The Director of the Business Development Group made a very succinct presentation of the firm's mission, its strengths, the threats, and

the strategy being followed. The company is small, less than 500 people, and does not yet feel the need of a written plan.

An interesting comment made was that the company was considering defining its charter because there were differences occasionally among members of the board of directors about the types of business the company should be pursuing. It should be noted that the planning model shows purpose as its first step.

#### 5. Company E: GTE Electronics Systems Group, Western Division

This organization has operated on a long-range plan for the past thirteen years. A summary of the division plan is provided to the group headquarters for inclusion into a group document to the corporate office.

Within the division, the organization is further broken down into business areas, each of which is a profit center. Each business area develops its own plan which follows the pattern of the planning model, except the resources of manpower, facilities, and engineering support are omitted. These resource factors are evaluated at division level and combined with the business area plans to form a comprehensive division five-year plan. This division plan appears to follow the planning model in all respects. An outline of the plan is shown below:

##### Section 1.

Mission Statement

Action Plan

**Marketing Plan**

**Research and Development Plan**

**Performance Plan**

**Manufacturing Plan**

**Facilities**

**Human Resources Plan**

**Five-Year Forecast .**

**Section 2.**

**Markets and Industry Characteristics**

**Planning Assumptions**

**Financial Record and Plan**

**Section 3.**

**Business Area Plans**

**Mission**

**Objectives**

**Market Segments**

**Situation Analysis**

**Market Outlook**

**Competition**

**Objectives, Strategies, and Operating Plans.**

This organization's plan has a novel aspect. In the introduction to the formal plan, a two-page summary of the outlook for the company, an estimate of the situation, is given by the general manager. This tends to set the tone; it establishes the personal endorsement of the leader of the organization.

Long-range planning has been practiced for a number of years and the company has standardized forms as a supplement to the narrative. For example, one form entitled, "Planning Assumptions," requires a listing of major factors affecting the business and the assumptions made for each of these factors. Some of the factors mentioned are the economic influence, the federal budget, export markets and the trends in technology. A listing of the standardized forms used follows:

- Mission
- Financial Record
- Planning Assumptions
- Market Segments
- Situation Analysis--Market Outlook
- Situation Analysis--Competition
- Objectives, Strategies, and Operating Plans.

The use of these forms tends to ensure that all parts of a proposed plan are considered. Flow charts and diagrams are used to show how business opportunities in a product line will be pursued. Research and development effort is identified with market opportunities.

Formal planning appears mature in this organization.

#### 6. Company F: Data General Corporation

Formal long-range planning was initiated in 1977, with the first five-year strategic plan for the period 1979-1983. The structure of

the 1984-1988 plan which the company is presently revising is shown below:

**Introduction**

Definition of the business, purpose, and scope

**Environment**

Markets

Environmental impacts

Competition

**Company Position**

Basic issues

Strengths and weaknesses

**Objectives and Strategies**

Financial objectives

Unit sales and market share objectives

**Supporting programs**

Organization

Financial

Marketing

Supply-of-Product

The company is structured functionally with marketing, manufacturing, and engineering reporting directly to the President. Therefore, there are no divisions, and consequently, no division plans. As shown, the functional organizations develop plans in support of the corporation objectives. The above model appears to

conform with the planning model, except for the omission of facilities planning. Data General's planning process can be characterized by nature but understanding that revisions are necessary to keep the firm dynamic.

#### 7. Company G: Control Data Corporation

This company is quite specific in their development of strategy. They have both a strategic plan and a five-year plan, both of which are updated each year. Starting about September each year, the four divisions of the Computer Products Group begin to develop, or update, their product strategies. This becomes the group's long-range plan which is then included in the company's strategic plan. It is devoted mostly to an examination and appraisal of the factors, external and internal, likely to affect each of the divisions. Each group, headed by a vice-president, has its own identifiable market and is a separate profit center.

Shortly after the beginning of the calendar year, the approved group long-range plans are consolidated into a formal five-year plan which summarizes the strategies but adds quantitative data. Whereas the strategic plan is devoted largely to discussion, quantifying only a few parameters such as sales, gross margins and profits, the five-year plan contains considerable quantified detail, including manpower and other resources. Prior to July 1, the beginning of the fiscal year for Control Data, the first year of the approved five-year plan is used to develop a bottom-up budgeting effort which



is translated into a formal profit plan (budget) for the coming fiscal year.

Control Data appears to practice long-range planning in a very serious fashion. One of the notable factors is the procedure of developing a strategic base before the long-range plan. The interest of the Chief Executive Officer in this aspect is also evident. The CEO [Ref. 12] has said,

The company at present is greatly given to questions of strategy. We spend quite a bit of time reviewing our early successes for guidelines to identify new markets. We seek new market segments in which we have some differentiation which allows us to expect to dominate certain very specific areas. . . . We are market sensitive. We are not at all able to control many of these markets. We do have to be very careful about what happens in these marketplaces and very much of our strategic thinking involves looking for niches or segments in which we feel we can build market share and which will turn into eventual sources of cash for our future requirements.

Control Data has been practicing formal long-range planning for about eight years. Yet the firm's rapid growth has extended over a decade. Like Hewlett-Packard Company, Control Data Corp., is a high technology firm, benefiting from the exploitation of some of their proprietary products. The company is structured with a product line responsibility.

The emphasis on strategic planning by the top officer in the corporation is interesting because it was the only firm in which top management interest was so vividly portrayed. The chief executive is the person largely responsible for deciding whether his firm should establish a formal planning system, for determining the main lines of the firm's strategy if formal planning is adopted, and for

seeing that the strategy is carried out. In every company the participation of top management in the development and execution of a strategic plan is essential to its success. [Ref. 13]

One of the real benefits of long-range planning is to help management make better current decisions. The time priority of short-term operational problems, however, tends to cause management to defer allocating sufficient time to long-range planning. Strategic decisions, a basis for long-range planning, are not repetitive and do not fight for attention. Unless actively pursued, they remain hidden behind the operating problems. Some executives view planning as an academic exercise; they persist in giving priority to operating activities, since strategy questions can usually be postponed. The top executive must take overt action to establish long-range planning, must allocate sufficient time to this aspect of the business, and must personally provide the leadership. This appears to be happening at Control Data.

This company's long-range plan closely follows the model plan, except in a few respects. No economic forecast was considered in the company plan; it was stated that such influence is considered in market appraisal. Research and development (R&D) activities were not mentioned in the plan except in those cases where such effort was being carried on under government contract. No reason was given for the absence of technical development plans.

In summary, this company's plan appears to follow the planning model closely.

#### A. OTHER CONSIDERATIONS

The preceding discussion has attempted to make a comparison between the planning model and each company's plan. This was done by breaking the planning model into small segments and then examining the company's plan to see if it considered these factors. With the exception of one company, Hewlett-Packard, it appears that the firms generally observe most of the items shown in the planning model. Differences are mainly in the extent of consideration of the internal and external factors.

It is also enlightening to look at other information which these companies consider. Most additional information sought appeared to be detail about the principal factors in the planning model. Some firms measured performance only in dollars, some measured in both dollars and other units, such as the number of contracts completed. One company spelled out the planning assumptions in great detail, and another concentrated on a vast amount of quantitative data. However, one company, Varian, included two items in its planning that was not found specifically elsewhere, namely, "Changes from Past Year" and "Contingencies and Alternatives." The questionnaire (Appendix A, Organization and Control, item 9) asks, "Do plans reference prior year's planning or build on a previous year's plan?" Only one firm responded affirmatively. Two companies manipulated the quantitative data to determine best and worst cases of their firm's performance.

This study also considers the time cycle. This may vary among companies due to the fiscal year of the firm. It was found in this study that the sequence of and approach to the development of the plan varied according to the size and organization of the corporation. In the smaller firm, the time cycle for preparation of the plan is generally shorter, as indicated under the discussion of the Dataproducts Corporation. More typical of the larger companies is the procedure followed by Varian.

In early October, the Varian corporate office issues planning instructions, accompanied by a general economic forecast, to all the groups. The instructions prescribe a format for a five-year plan. The instructions do not provide guidelines on the profits expected from each group. The matter of setting expected profit goals was not found in the formal planning process at any point. This matter appears to be handled separately by informal discussions among the parties involved. This treatment was common to all the companies in the study.

During the period from October through February of the following year, the group and division operating managers compile a five-year plan. In March, the plans are reviewed at the corporate level, with each group making a presentation. If approved, or approved subject to modification, the first year becomes the basis for an operational plan. From this a budget is developed. The long-range plan is the basis for a presentation to the board of directors in May. Varian's fiscal year begins on the first of July.

Were there any discernible patterns in the use of the planning resource, the planning office? As indicated earlier, each firm has a planning position.

It was found that Hewlett-Packard is somewhat unique in its planning process. At Hewlett-Packard the strategic policy for growth has been the development of new proprietary products. This has remained the policy for years even though implementation of such policy in the marketplace may vary. H-P looks to its group and division managers to develop whatever strategic planning is necessary to implement this policy. The use of the corporate planning facility does not appear to be involved except that it may analyze and make recommendations on quantitative effects in the compilation of all the plans.

In this study, the other companies used the planning position to motivate and plan with the operating managers, to conduct certain studies, to provide alternate strategies, and to make recommendations to top divisional and corporate management. In all companies the planning office has the function of issuing instructions and coordinating the gathering of the data that make up the long-range plan. Thus the use of the planning position varies from firm to firm, reflecting the company's concept of both the use of formal long-range planning and the use of its planning resource to accomplish it.

Closely allied to the foregoing is the question of use of the formal long-range planning document. It was noted that once the

plan had received top management approval, it rarely became the subject of any later formal review. The reason generally given was that the first year of the plan became the operating profit plan (budget) and this was subject to monthly reviews. It was found that in no case was a formally approved plan ever revised. If subsequent actions had a marked effect on the plan, the next year's long-range plan reflected this. For example, a planned growth rate or market penetration may not now appear achievable; the following year's long-range plan would reflect a different growth rate of market penetration rate. This raised the subject of reference in the plan to prior year's objectives and evaluations. It was found that the published plan rarely referenced the prior year planning. As one respondent expressed it, "Frankly, our trouble spots are so well known, and discussed so frequently, we hardly need review."

It would appear that current practice is to recognize that the process of developing strategies to further the corporate purpose is the major benefit gained in developing the long-range plan. As E. Kirby Warren [Ref. 14] expressed it:

The biggest single failure in most of these companies has been the failure to recognize that to an even greater degree than in annual planning it is the process, the mechanism for planning, and not the plan that is of greatest importance. It cannot be overemphasized that with few exceptions the purpose of long-range planning is not nearly so much having a plan as developing processes, attitudes and perspectives which make planning possible. . . . Developing formal, comprehensive long-range plans is merely a means to an end.

Vancil and Lorange [Ref. 15] stated it this way:

There is little doubt that formalizing the planning process is worthwhile; it ensures that managers at all levels will devote some time to strategic thinking, and it guarantees each of them an audience for his ideas.

The most common time period used in the formal long-range plans was five years. Since these plans were never revised after formal approval, but were always updated annually, it appeared that conditions did not change sufficiently to require shorter periods of formal review. This is in marked contrast to the findings of a special report on corporate planning (pages 46-52) by the editors of Business Week (April 28, 1975) which stated:

For corporate planners and the top executives who rely on their advice, the world has never looked as hostile or as bewildering as it does today. The very uncertainties, from the clouded economic outlook to the energy crisis, that make sophisticated forward planning more vital than ever before, also make accurate planning that much more difficult. . . Companies are reviewing and revising plans more frequently in line with changing conditions. Instead of the old five-year plan that might have been updated annually, plans are often updated quarterly, monthly or even weekly.

This condition was not found in the study; it is probable that Business Week may have been referring to the operational plan or the budget, rather than the long-range plan. It is difficult to imagine strategic decisions needing to be made and revised monthly.

In this study it was found that five companies made use of a computer in their planning. It was not used for modeling but rather to measure best and worst conditions. It does not appear that modeling or simulation plays a significant part in the development of long-range planning. The study was limited to seven companies in the San Francisco Bay Area and thus the results cannot be considered

necessarily typical for the electronics industry in general. It may, however, give some indication of the level of interest in long-range planning. It may also indicate the degree to which companies are still struggling with how to apply long-range plans.



## V. FINDINGS AND CONCLUSIONS

### A. SUMMARY OF FINDINGS

1. Six of the seven companies studied practiced formal long-range planning. The smallest firm of the group did not develop a formal long-range plan.

2. One of the companies followed a pattern of long-range planning that varied considerably from the theoretical planning model used as a baseline. The plan of this firm did not specify strategies and action plans. This firm's plan was less formally structured than that of the other firms.

3. The plans of the other five companies more closely conformed to the planning model. There were however, significant differences. Some differences appeared to be major, some were minor, and some were being modified. Most differences were due to available data not being integrated into the plan.

4. Of the seven companies studied, only two have engaged in formal long-range planning prior to fifteen years ago.

5. Companies with limited experience are modifying their approach to long-range planning as their experience grows. The contemplated changes will bring their approach to long-range planning more in conformity with the planning model.

6. Five years was the time period used in the long-range plan by five of the six firms. All companies updated their plans annually; none have ever revised their plans within the year.

## B. CONCLUSIONS

1. Companies differ in their approach to formal long-range planning. The differences occur more in the content of the written plan than in the planning process. Omission of planning factors in the formal plan exists because the data used in planning is available from another source; it has not been integrated into the planning document. For example, consideration of the technology involved in pursuing a strategy is contained in the firm's research and development (R&D) plan. This knowledge is used in the planning process, but the long-range plan does not explicitly reference the R&D as a resource.
2. The decision to establish in the organization a specific position to coordinate long-range planning activities appears to indicate a growing concern for the formal development of strategic planning.
3. In view of the extensive literature published on the subject of long-range planning, it is surprising to find that, in many companies, formal planning has been in use for such a short period of time.
4. Although most companies adopt a five-year period for their plan, this pattern seems to be one of custom. It is concluded that the pattern of annual revision provides the feedback and the needed flexibility in planning.
5. Graduate schools of business have both an opportunity and

responsibility to teach students, and to provide seminars for business men, in the techniques of long-range planning and the concepts of strategy.

## APPENDIX A

### QUESTIONNAIRE

Company \_\_\_\_\_

Note: Prior to commencing the interview, the researcher explained the general format of the interview to the subject while refraining from telling him very much about the purpose of the interview. This prevents the subject from tailoring his answers to what the researcher wants to hear.

#### GENERAL:

1. Does the company have a formal document called a PLAN?
2. Does the company have somebody or a group designated PLANNER?
3. Where is PLANNER placed in the organization?
4. Is the PLAN a
  - (1) Strategic Plan?
  - (2) Operational Plan?
  - (3) Combination of above?
  - (4) Other?
5. If PLAN is composed of separate sections for strategy and operations, are both sections published and/or distributed separately?
6. If so, how are they coordinated?

**FORMAT:**

1. What is time period covered by the PLAN?
2. What parts of the PLAN are limited to lesser time periods?
3. How often is the plan revised? Any revision delays? If so what were the causes of the delays?
4. What causes a deviation from this frequency?
5. Has this occurred in the last five years? Is so, why?
6. Are details of the operating budget included in the PLAN?

**ORGANIZATION AND CONTROL:**

1. What is the sequence of events in developing the PLAN?
2. Is the PLAN a "top down" or "bottom up" effort, or both?
3. How long has formal planning been done in this company?
4. How are differences between division officers/department heads and top management resolved?
5. How often are formal progress reviews held after PLAN has been approved?
6. Are these formal reviews devoted only to a review of the PLAN?
7. Do changes or amendments to the PLAN result from these reviews?
8. Is the change formalized by issuance of an amended PLAN?
9. Do PLANs reference prior year's planning or build on a previous year's PLAN?
10. Is there a classified or confidential section of the PLAN for which distribution is limited or not made?

11. Is there sensitive material of a planning nature that is not suitable for publication?
12. How is this disseminated?
13. Is any use made of math and/or computer models in the planning process?

#### MISSION:

1. Does the PLAN set forth the mission (purpose) of the organization (other than maximization of profits)?
2. Does it highlight or describe the salient factors influencing the mission?
3. Does it highlight or describe the assumptions made on the above factors?
4. Is the scope of the mission defined explicitly in terms of:
  - (a) market segments?
  - (b) product or services?

#### OBJECTIVES:

1. Are objectives (corporate and/or division) set forth in the PLAN?
2. Are these objectives published elsewhere than in the PLAN?
3. What is the time period covered by the objectives?
4. Are objectives explicit, or are goals established to measure attainment of objectives?
5. Are objectives stated in terms of:

- (a) profitability
  - (b) growth; market share; sales; other
  - (c) product quality
  - (d) service
  - (e) image
  - (f) other
6. Are objectives measured quantitatively?
  7. Are they reviewed:
    - (a) in the course of regular operations?
    - (b) in a specified, scheduled, formal planning review?
    - (c) other

#### ECONOMIC FORECAST:

1. Does the PLAN have one?
2. Is it specific as to time covered; does it correspond to time frame of the PLAN?
3. Does the economic forecast make use of any standard statistical indices and projections such as GNP, DOD budget, etc.?
4. Is the economic forecast specific in relating the economic environment to its effects on specific products or services?
5. How is the economic forecast obtained or generated (who, how, when, etc.)?

#### COMPETITION:

1. Does the PLAN treat competition:

- (a) generally
  - (b) specifically by:
    - 1. name of competitor
    - 2. product
    - 3. market
  - 2. Does the PLAN specifically indicate the market shares of the company and its competitors:
    - (a) quantitatively
    - (b) generally
    - (c) by product or overall
  - 3. Does the PLAN attempt to identify competitor's strategy?
  - 4. Does the PLAN attempt to identify competitor's strengths/weaknesses?
  - 5. Does the PLAN attempt to identify your own strengths/weaknesses?
  - 6. Does the PLAN attempt to specifically identify and appraise both the competitor's and your company's strengths and weaknesses in:
    - (a) marketing
    - (b) manufacturing
    - (c) technology
    - (d) strategy
    - (e) logistics
    - (f) financial position
- Is this done in quantitative terms?



#### RESOURCES:

1. Is the PLAN explicit in terms of the manpower required:
  - (a) over time?
  - (b) by skill required?
  - (c) by experience/training?
2. Are property and equipment needs identified specifically by:
  - (a) time?
  - (b) specific function?
3. Are capital requirements specifically identified by amount or by time required?
4. What is the minimum dollar value to warrant specific mention in the PLAN?
5. How is financial planning coordinated with the above?
6. Does the PLAN specifically discuss R&D? If "yes," how in terms of:
  - (a) dollar effort,
  - (b) product development,
  - (c) other?
7. Does the PLAN mention possible property acquisition considerations?
8. Does the PLAN mention the company's propensity to diversify?

#### SOCIAL PLANNING:

1. Does the PLAN mention the company involvement in:
  - (a) environmental matters?

- (b) the seeking of social acceptance?
- (c) involvement in public responsibility affairs?
- (d) sponsoring of effort to aid minorities?
- (e) charitable work in support of:
  - (1) The Arts
  - (2) public television

**STRUCTURE:**

1. What is the number of pages in the formal PLAN?
2. Is there different distribution for different sections of the PLAN?
3. If so, please detail.
4. To what levels of management is distribution made?
5. What are the items in the Table of Contents?

## APPENDIX B

### SELECTED READINGS

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